

IEPA PERMIT WRITER'S PHOSPHORUS CHECKLIST

Facility Name: Springfield Metro Sanitary Dist. Sugar Creek Plant

Facility Permit Number: IL0021971

	YES	NO
1. Does the facility discharge upstream from or directly to a water body segment on the State of Illinois CWA § 303(d) list for either dissolved oxygen or unnatural growth of plants or algae?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2. If the facility discharges upstream of or directly to a water body segment with an approved TMDL for phosphorus, does the permit have: a. A numeric effluent limit for total phosphorus that is consistent with the assumptions and requirements of the WLA in the TMDL, or b. Conditions that are consistent with the conclusions or findings of the TMDL?	<input type="checkbox"/> <input type="checkbox"/>	NA <input type="checkbox"/> <input type="checkbox"/>
3. If the facility discharges upstream of or directly to a water body segment on the State of Illinois CWA § 303(d) list for either dissolved oxygen or unnatural growth of plants or algae, but a TMDL is not yet approved, does the permit have any of the following: a. A numeric effluent limit for total phosphorus of 1 mg/L or less; b. Limitations or conditions consistent with an alternative water quality study, or c. Conditions with appropriate monitoring and modeling for development of a numeric effluent limit	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	NA <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
4. If the facility discharges directly to or within 25 miles upstream from a lake or reservoir that is 20 acres or more in size, does the permit have a numeric effluent limit for total phosphorus of 1 mg/L or less?	<input type="checkbox"/>	<input type="checkbox"/> NA
5. If the facility is new or expanded as provided in 35 Ill. Adm. Code 304.123 g)3), does it have a design average flow of 1.0 MGD or more receiving primarily domestic wastewater or, for other than primarily domestic wastewater, does the facility have a phosphorus load of 25 lbs/day or more?	<input checked="" type="checkbox"/> (proceed to question 6)	<input type="checkbox"/>
6. If yes to question 5, does the permit have a numeric limit for Total P of 1 mg/L or less?	<input checked="" type="checkbox"/> (proposed expansion only)	<input type="checkbox"/>

Please provide completed checklists to EPA Region 5, NPDES Programs Branch, Chief of Section 1 not less than 30 days before the anticipated public notice date of permits for all major dischargers. On review of a given checklist, EPA may elect to review the permit under 40 C.F.R. § 123.44.



ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276 - (217) 782-2829
JAMES R. THOMPSON CENTER, 100 WEST RANDOLPH, SUITE 11-300, CHICAGO, ILLINOIS 60601 - (312) 814-6026

PAT QUINN, GOVERNOR

LISA BONNETT, INTERIM DIRECTOR

Memorandum

RECEIVED
OCT 27 2011

ILLINOIS ENVIRONMENTAL
PROTECTION AGENCY
BOW/WPC/PERMIT SECTION

DATE: October 26, 2011

TO: Gregg Sanders *Brumfield Fleming*

FROM: Bob Mosher *RM*

SUBJECT: Springfield SD – Sugar Creek STP Water Quality Based Effluent Limit Evaluation
NPDES #IL0021971 (Sangamon County)

The subject facility discharges to Sugar Creek at a point where 1.5 cfs of flow exists upstream of the outfall during critical 7Q10 low-flow conditions. The DAF of this facility is 10.0 MGD and in 2010 the average of the three lowest effluent flow months was 8.07 MGD. Sugar Creek (segment EOA-06) is a General Use water. Sugar Creek is listed on the draft 2010 Illinois Integrated Water Quality Report and Section 303(d) List as an impaired water body for aquatic life uses. Potential causes of aquatic life use impairment are given as alterations in stream-side vegetative cover (non-pollutant), boron, and total phosphorus. Sugar Creek is not listed as a biologically significant stream in the 2008 Illinois Department of Natural Resources Publication *Integrating Multiple Taxa in a Biological Stream Rating System* at this locality, nor is it given an integrity rating in that report. Sugar Creek is not designated as an enhanced water at this location pursuant to the dissolved oxygen water quality standard.

Cadmium, Chromium (Trivalent), Copper, Lead, Nickel, and Zinc standards are based on hardness data collected at AWQMN Station E-26, Sangamon River at old Rt. 36 Bridge in Riverton with a critical hardness value of 260 mg/L as CaCO₃. Water quality standards identified in the table are expressed in units of mg/L. Dissolved metals standards have been converted to total metal except where noted. Samples were collected and analyzed by both the facility and Illinois EPA.

Substance	Max. Eff. Conc.	No. of Samples	Multiply by	95% Potential	Acute Standard	Chronic Standard	302.208(g) standard	Further Analysis?
Arsenic	<0.05	20	-	-	0.3600	0.1900	-	No RP*
Barium	0.08	63	1.1	0.088	-	-	5.0	No RP*
Cadmium	0.001	63	1.1	0.0011	0.0286	0.0024	-	No RP*
Chromium (Hex)	<0.01	20	-	-	0.0160	0.0110	-	No RP*
Chromium (Total)	<0.01	63	-	-	3.7979	0.4527	-	No RP*
Cyanide (WAD)	<0.01	20	-	-	0.0220	0.0052	-	No RP*
Copper	0.011	63	1.1	0.0121	0.0436	0.0268	-	No RP*
Fluoride	1.1	20	1.4	1.54	-	-	1.4	Yes
Iron (Dissolved)	0.1	20	1.4	0.14	-	-	1.0	No RP*
Lead	0.011	63	1.1	0.0121	0.3230	0.0677	-	No RP*
Manganese	0.07	63	1.1	0.077	8.70	3.70	-	No RP*

ROCKFORD - 4302 N. MAIN ST., ROCKFORD, IL 61103 - (815) 987-7760

ELGIN - 595 SOUTH STATE, ELGIN, IL 60123 - (847) 608-3131

CHAMPAIGN - 2125 S. FIRST ST., CHAMPAIGN, IL 61820 - (217) 278-5800

COLLINSVILLE - 2009 MALL STREET, COLLINSVILLE, IL 62234 - (618) 346-5120

DES PLAINES - 9511 HARRISON ST., DES PLAINES, IL 60016 - (847) 294-4000

PEORIA - 5407 N. UNIVERSITY, ARBOR HALL #113, PEORIA, IL 61614 - (309) 693-5463

MARION - 2309 W. MAIN ST., SUITE 116, MARION, IL 62959 - (618) 993-7200

Mercury (ng/L) **	2.7	16	1.5	4.1	-	-	12.0	No RP*
Nickel	0.016	63	1.1	0.0176	0.1852	0.0112	-	Yes
Phenols	0.012	20	1.4	0.0168	-	-	0.1	No RP*
Silver	0.0065	63	1.1	0.0072	-	-	0.005	Yes
Zinc	0.13	63	1.1	0.143	0.2745	0.0712	-	Yes
Selenium	0.005	63	1.1	0.0055	-	-	1.0	No RP*
Boron	0.448	43	1.1	0.4928	40.1	7.6	-	No RP*
Ethyl benzene	0.0027	5	2.3	0.0062	0.150	0.014	-	No RP*
Bis(2-ethylhexyl) phthalate	0.0124	5	2.3	0.0285	0.4	0.38	0.0019+	Yes

* No RP = no reasonable potential to exceed water quality standards.

** Mercury is reported in ng/L with the human health standard of 12 ng/L

*** Corrected chronic standard is given.

+ derived human health criterion

Other monitored parameters, such as organics, with no reported detections are not listed.

Further Analysis:

None of the 20 fluoride results exceeded the water quality standard. Since fluoride is a closely regulated additive to drinking water, no undue risk of exceeding the standard is present. No permit limits are necessary.

None of the 63 results exceeded the acute water quality standard for nickel. The average of the results is far lower than the chronic water quality standard. No permit limits are necessary.

One silver result out of 63 slightly exceeded the water quality standard. This value is likely an outlier. No permit limits are necessary.

None of the 63 results exceeded the acute water quality standard for zinc. The average of the results is far lower than the chronic water quality standard. No permit limits are necessary.

Bis(2-ethylhexyl) phthalate exceeded the human health water quality criterion in two samples. However, this substance is a common contaminant.

Recommendations:

Attached is a copy of the Ammonia Worksheet used to derive the appropriate water quality based effluent limits based on 35 IAC Part 355.

Daily maximum ammonia limits are based on acute water quality standards with no mixing. Limits are 6.9 mg/L for the spring/fall season, 6.9 mg/L summer and 8.4 mg/L winter.

Monthly average limits are based on the chronic water quality standards with no mixing. Limits are 1.5 mg/L for the spring/fall season, 1.4 mg/L summer and 4.0 mg/L winter.

Weekly average limits are based on the sub-chronic water quality standard with mixing. The limit for the spring/fall season is 3.8 mg/L and limit for the summer season is 3.5 mg/L. No value is recommended for the winter season because it would exceed the daily maximum limit.

My evaluation of the metals and other substances given in the table finds that no water quality standards based permit limits are necessary for any parameter. Water quality standards for these substances will be met at end-of-pipe. Bis(2-ethylhexyl) phthalate should have a monitoring condition to establish whether the measured results are truly effluent concentrations or come from contaminated sampling apparatus or laboratory equipment. One sample per month monitoring for the first six months after the effective date of the renewed permit should be required.

No whole effluent biomonitoring other than the routine four rounds of acute testing was recommended in an June 14, 2011 memo from Brian Koch. No acute toxicity was found in this effluent in recent tests.

These recommendations reflect a water quality standards perspective only and should not be construed as being inclusive of all factors which must be taken into consideration by the permit writer.

RGM:djp/springfieldsugar

Attachment

cc: FOS Region 5 Manager
Bill Ettinger

Ammonia Worksheet

Discharger: Springfield SD Sugar Creek STP NPDES: IL0021971 Date: 10/26/11
 Receiving Stream: Sugar Creek

Calculation of the total ammonia (as N) water quality standard

pH and temperature values used in calculation				Total ammonia (as N) water quality standard		
	pH		temp		Chronic	Acute
	50th %ile	75th %ile	75th %ile		(50th %ile)	(75th %ile)
Spring/Fall	7.90	8.10	20.1	Spring/Fall	2.0	1.5
Summer	7.90	8.10	25.8	Summer	1.4	1.0
Winter	7.70	8.00	6.9	Winter	5.8	4.0

Data Source: Springfield SD monitoring station in Sangamon River downstream of outfall for the dates January 2005 through January 2011

Note: Calculation of total ammonia (as N) water quality standards are based on the algorithms found at 35 IAC 302.212(b) and recommended water quality based limits for ammonia are derived pursuant to methodologies outlined at 35 IAC Part 355.
 Spring/Fall consists of March - May, September - October.
 Summer consists of June - August.
 Winter consists of November - February.

Chronic Wasteload Allocation

$$C_e = [C_{ds}(Q_{us} + Q_e) - C_{us}Q_{us}] / Q_e$$

Effluent Flow (Q _e):	12.5 cfs	2010 low 3 months average flow
Upstream 7Q10:	1.5 cfs	Source: ISWS 7Q10 map
7Q10 for dilution (Q _{us}):	0.75 cfs	
background concentrations:		
spring/fall	0.030 mg/L	Source: AWQMN Station EOA-01, Sugar Creek at Rt. 29
summer	0.020 mg/L	for the dates Jan. 2006 to Oct. 2007.
winter	0.140 mg/L	
wasteload allocation:		
spring/fall	2.1 mg/L	(based on 50th percentile pH and mixing)
summer	1.4 mg/L	(based on 50th percentile pH and mixing)
winter	6.2 mg/L	(based on 50th percentile pH and mixing)

Note: Chronic wasteload allocations are calculated using a steady-state mass balance approach and procedures found at 35 IAC 355.203.

No ZID Available

Acute Wasteload Allocation

$$C_e = S(C_{ds} - C_{us}) + C_{us}$$

predicted stream width:	ft.	
diameter of outfall pipe (d):	ft.	wasteload allocation: spring/fall
maximum ZID radius (x):	0 ft.	summer
S = 0.3 (x/d) =		winter
		6.9 mg/L
		6.9 mg/L
		8.4 mg/L

Note: Acute wasteload allocations are determined using the jet-momentum equation found in USEPA's Technical Support Document for predicting near-field mixing characteristics. Outfall pipe diameters are based on Manning's equation and n=0.013.

WQBELs Recommended:	Daily Maximum:	spring/fall	6.9 mg/L	
		summer	6.9 mg/L	
		winter	8.4 mg/L	
	30-day Average:	spring/fall	1.5 mg/L	**
		summer	1.4 mg/L	
		winter	4.0 mg/L	**
	Weekly Average*:	spring/fall	3.8 mg/L	
		summer	3.5 mg/L	
		winter	N/A mg/L	***

* Note: Weekly average limits are based on the subchronic standard which is defined as 2.5 times the chronic limit at 35 IAC 302.212(b)(3) and Part 355.

**Note: Part 355 limits value to 1.5 and 4.0 mg/L

*** Value would exceed that of the daily maximum



ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276 • (217) 782-3397

PAT QUINN, GOVERNOR

JOHN J. KIM, INTERIM DIRECTOR

Memorandum

Date: 12 June 2012
To: Brant Fleming
From: Scott Twait *ST*
Subject: Springfield Metro SD – Sugar Creek -- Antidegradation Assessment
 NPDES Permit No. IL0021971 (Sangamon County)

The subject facility is proposing to replace the existing activated sludge facility with design average flow (DAF) of 10.0 MGD with a VertiCel facility with a DAF of 15.0 MGD. The consultant has estimated that the wastewater being treated at the Sugar Creek facility will increase by 50% in the next twenty years. The District has given consideration to ammonia nitrogen and total phosphorus removal.

The facility is proposing to remove phosphorus and denitrify biologically. The NPDES permit will have a permit limit of 1.0 mg/L for phosphorous. Therefore, loading of phosphorus and nitrogen to the receiving stream will be reduced.

The information in this antidegradation assessment came from the January 2012 Wastewater Treatment Facilities Planning Report by Crawford, Murphy & Tilly, Inc.

Identification and Characterization of the Affected Water Body.

The subject facility discharges to Sugar Creek at a point where 1.5 cfs of flow exists upstream of the outfall during critical 7Q10 low-flow conditions. Sugar Creek (segment EOA-06) is a General Use water. Sugar Creek is not listed as a biologically significant stream in the 2008 Illinois Department of Natural Resources Publication *Integrating Multiple Taxa in a Biological Stream Rating System* at this locality, nor is it given an integrity rating in that report. Sugar Creek is listed on the draft 2010 Illinois Integrated Water Quality Report and Section 303(d) List as an impaired water body for aquatic life uses. Potential causes of aquatic life use impairment are given as alterations in stream-side vegetative cover (non-pollutant), boron, and total phosphorus. Sugar Creek is not designated as an enhanced water at this location pursuant to the dissolved oxygen water quality standard.

Identification of Proposed Pollutant Load Increases or Potential Impacts on Uses.

The treated domestic waste that characterizes this proposed effluent would be similar to other treated effluents of largely domestic origin. Ammonia limits in the permit will be set at water quality standards, however; ammonia loading to the receiving stream will increase over existing background levels as the expanded effluent discharge will be allowed an average of 643.6 lbs/day (as a weighted average), up from the currently allowed level of 429.5 lbs/day (as a weighted average). Biochemical oxygen demand (BOD) permit limits will be set at the most stringent effluent standards applicable in 35 IAC 304.120. The stream will nonetheless experience an increase in loading in BOD as the expanded effluent discharge will be allowed an average of 3128 lbs/day, up from the currently allowed level of 2085 lbs/day. A dissolved oxygen model, submitted in the facility plan, was used to determine the impact of the expansion on the receiving stream. The model indicated that the dissolved oxygen difference between the current DAF of 10 MGD and the proposed DAF of 15 MGD will be 0.44 mg/L.

Phosphorus and total nitrogen loading will decrease as a result of the expanded facility removing phosphorus and denitrifying. The Agency is developing state water quality standards that will formulate the basis for future nutrient management strategies. Upon adoption of state standards and development of a management strategy, there may be additional nutrient reduction requirements imposed on this source. The Illinois Nutrient Standards Workgroup has been convened to develop nutrient standards and will strive to keep NPDES permitted dischargers aware of its findings, allowing them to anticipate future nutrient permit limits.

Fate and Effect of Parameters Proposed for Increased Loading.

The BOD and ammonia discharged by this facility will decay into simpler and harmless byproducts by naturally occurring organisms in the receiving stream. Some of the nitrogen originating in the ammonia will remain in the stream in the form of nitrates or organic nitrogen. Ammonia and dissolved oxygen standards will be met in the receiving stream.

Purpose and Social & Economic Benefits of the Proposed Activity.

The proposed project continues to provide treatment capacity for future growth at the centralized treatment facilities that treats wastewater from Springfield, Rochester, Clear Lake Village and CWLP (cooling tower water).

Assessments of Alternatives for Less Increase in Loading or Minimal Environmental Degradation.

The facilities Plan investigated the feasibility of land application of the additional flow (5 MGD). This would require at least 2,169 acres. It was determined to not be feasible to land apply the additional flow.

The facility has proposed constructing a biological system to denitrify and remove total phosphorus.

Summary Comments of the Illinois Department of Natural Resources, Regional Planning Commissions, Zoning Boards or Other Entities.

On June 12, 2012, the IDNR EcoCAT web-based tool was used and indicated that there were no endangered/threatened species present in the vicinity of the discharge. While the IDNR EcoCAT web-based tool did not terminate the consultation because of the nearby presence of wetlands, future termination is likely.

Agency Conclusion.

This preliminary assessment was conducted pursuant to the Illinois Pollution Control Board regulation for Antidegradation found at 35 Ill. Adm. Code 302.105 (antidegradation standard) and was based on the information available to the Agency at the time the draft permit was written. We tentatively find that the proposed activity will result in the attainment of water quality standards; that all existing uses of the receiving stream will be maintained; that all technically and economically reasonable measures to avoid or minimize the extent of the proposed increase in pollutant loading have been incorporated into the proposed activity; and that this activity will benefit the community at large by providing treatment capacity for future growth. Comments received during the NPDES permit public notice period will be evaluated before a final decision is made by the Agency.

CC: Bob Mosher
Springfield Regional Office
Bill Ettinger
Chron



ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276 • (217) 782-3397

PAT QUINN, GOVERNOR

JOHN J. KIM, INTERIM DIRECTOR

Memorandum

DATE: 12 June 2012

TO: Brant Fleming

FROM: Scott Twait *ST*

SUBJECT: **WQBELs**
Springfield Metro SD – Sugar Creek **NPDES Permit No. IL0021971**
(Sangamon County)

The subject facility discharges to Sugar Creek at a point where 1.5 cfs of flow exists upstream of the outfall during critical 7Q10 low-flow conditions. Sugar Creek (segment EOA-06) is a General Use water. Sugar Creek is not listed as a biologically significant stream in the 2008 Illinois Department of Natural Resources Publication *Integrating Multiple Taxa in a Biological Stream Rating System* at this locality, nor is it given an integrity rating in that report. Sugar Creek is not designated as an enhanced water at this location pursuant to the dissolved oxygen water quality standard.

The Springfield Metro SD – Sugar Creek facility discharges to Sugar Creek. Sugar Creek, Waterbody Segment, EOA-06, is listed on the draft 2010 Illinois Integrated Water Quality Report and Section 303(d) List as impaired for aquatic life use with potential causes given as alteration in stream-side or littoral vegetative cover (non-pollutant), boron, and phosphorus. From the treatment plant to the end of segment EOA-06 is a distance of 3.18 stream miles.

Sugar Creek flows to the Sangamon River (E-26). The draft 2010 303(d) List indicates that fish consumption use is impaired with potential cause given as polychlorinated biphenyls and primary contact use is impaired with potential cause given as fecal coliform. Aquatic life use is fully supported. Segment E-26 is 10.66 stream miles in length.

Segment E-04 is the next segment of the Sangamon River. The draft 2010 303(d) List indicates that fish consumption use is impaired with potential cause given as polychlorinated biphenyls. Aquatic life use is fully supported. Segment E-04 is 15.7 stream miles in length.

Segment E-24 is the next segment of the Sangamon River. The draft 2010 303(d) List indicates that fish consumption use is impaired with potential cause given as polychlorinated biphenyls and primary contact use is impaired with potential cause given as fecal coliform. Aquatic life use is fully supported. Segment E-24 is 22.99 stream miles in length.

Segment E-25 is the next segment of the Sangamon River. The draft 2010 303(d) List indicates that fish consumption use is impaired with potential cause given as polychlorinated biphenyls and primary contact use is impaired with potential cause given as fecal coliform. Aquatic life use is fully supported. Segment E-25 is 36.42 stream miles in length.

The Springfield Metro SD – Sugar Creek effluent travels a total of 88.95 miles before it joins the Illinois River. There is no algae impairment noted in the 303(d) List nor is there any impairment due to a cause of dissolved oxygen anywhere in this downstream continuum. There is no evidence to imply that phosphorus from the Springfield Metro SD – Sugar Creek facility is causing any impairment prohibited by the narrative water quality standard.

Expanded Facility

Since this is a major facility that is expanding, a NPDES permit limit of 1.0 mg/L for phosphorus is appropriate as per 35 IAC 304.123(g).

Attached is a copy of the Ammonia Worksheet used to derive the appropriate water quality based effluent limits based on 35 IAC Part 355.

Given the predicted ambient conditions of Sugar Creek near the outfall, as determined using site-specific monitoring in Sangamon River downstream of outfall, monthly average limits of 1.5 mg/L (spring/fall), 1.4 mg/L (summer), and 4.0 mg/L (winter) are appropriate. The spring/fall, and winter limits are based on 75th percentile pH and allowed mixing and the summer limit is based on median pH and allowed mixing.

Daily maximum limits of 6.9 mg/L (spring/fall), 6.9 mg/L (summer), and 8.4 mg/L (winter) are recommended. These limits reflect the seasonal acute water quality standards with no mixing allowance since the stream has insufficient stream width for discharge induced mixing.

If applicable, weekly average limits of 3.8 mg/L (spring/fall) and 3.5 mg/L (summer) are appropriate. These values are based on 2.5 times the chronic limit. No weekly average limit for winter is recommended because the value would be higher than the daily maximum permit limit.

These recommendations reflect a water quality standards perspective only and should not be construed as being inclusive of all factors that must be taken into consideration by the permit writer.

Attachment

cc: Bob Mosher
Springfield Regional Office
Bill Ettinger
Chron

Ammonia Worksheet

Discharger: Springfield Metro SD - Sugar Creek NPDES: IL0021971 Date: 6/12/12
 Receiving Stream: Sugar Creek

Calculation of the total ammonia (as N) water quality standard

	pH and temperature values used in calculation			Total ammonia (as N) water quality standard		
	pH	temp		Chronic	Acute	
	50th %ile	75th %ile	75th %ile	(50th %ile)	(75th %ile)	(75th %ile)
Spring/Fall	7.90	8.10	20.1	2.0	1.5	6.9
Summer	7.90	8.10	25.8	1.4	1.0	6.9
Winter	7.70	8.00	6.9	5.8	4.0	8.4

Data Source: Site-specific monitoring station in Sangamon River downstream of outfall, for the dates Jan. 2005 to Jan. 2011.

Note: Calculation of total ammonia (as N) water quality standards are based on the algorithms found at 35 IAC 302.212(b) and recommended water quality based limits for ammonia are derived pursuant to methodologies outlined at 35 IAC Part 355.
 Spring/Fall consists of March - May, September - October.
 Summer consists of June - August.
 Winter consists of November - February.

Chronic Wasteload Allocation

$C_e = [C_{ds}(Q_{us} + Q_e) - C_{us}Q_{us}] / Q_e$

Effluent Flow (Q _e):	23.2 cfs	DAF (15.0 MGD)
Upstream 7Q10:	1.5 cfs	Source: ISWS map of the Sangamon Region.
7Q10 for dilution (Q _{us}):	0.75 cfs	
background concentrations:		
spring/fall	0.030 mg/L	Source: AWMN station EOA-01, Sugar Creek, at Rt. 29,
summer	0.020 mg/L	for the dates Jan. 2006 to Oct. 2007.
winter	0.140 mg/L	
wasteload allocation:		
spring/fall	1.5 mg/L	(based on 75th percentile pH and mixing)
summer	1.4 mg/L	(based on median pH and mixing)
winter	4.1 mg/L	(based on 75th percentile pH and mixing)

Note: Chronic wasteload allocations are calculated using a steady-state mass balance approach and procedures found at 35 IAC 355.203.

Acute Wasteload Allocation

$C_e = S(C_{ds} - C_{us}) + C_{us}$

(Note: Insufficient stream width for discharge induced mixing.)

predicted stream width:	ft.	
diameter of outfall pipe (d):	ft.	wasteload allocation: spring/fall 6.9 mg/L
maximum ZID radius (x):	0 ft.	summer 6.9 mg/L
S = 0.3 (x/d) =		winter 8.4 mg/L

Note: Acute wasteload allocations are determined using the jet-momentum equation found in USEPA's Technical Support Document for predicting near-field mixing characteristics. Outfall pipe diameters are based on Manning's equation and n=0.013.

WQBELs Recommended:	Daily Maximum:	spring/fall	6.9 mg/L
		summer	6.9 mg/L
		winter	8.4 mg/L
	30-day Average:	spring/fall	1.5 mg/L
		summer	1.4 mg/L
		winter	4.0 mg/L**
	Weekly Average*:	spring/fall	3.8 mg/L
		summer	3.5 mg/L
		winter	N/A mg/L

* Note: Weekly average limits are based on the subchronic standard which is defined as 2.5 times the chronic limit at 35 IAC 302.212(b)(3) and Part 355.

** Note: Agency policy does not grant allowed mixing in excess of 1.5/1.5/4.0 mg/L for the spring/fall, summer, and winter seasons respectively for nitrifying facilities. The spring/fall and winter limits were based on 75th percentile pH and allowed mixing and the summer limit is based on median pH and allowed mixing and limited to 4.0 mg/L because median pH was used.